Wisconsin Urban & Community Forests
Growing. Giving. — 2004 • YEAR OF — WISCONSIN FORESTRY
A Quarterly Newsletter of the Wisconsin Department of Natural Resources, Forestry Division

Phytoremediation: Green Creating Clean

This article is condensed from the 2001 book, In Situ Treatment Technology, *by Eric P. Carman and Tom L. Crossman. Eric Carman spoke on this topic at the 2004 urban forestry conference in Green Bay.*

What is phytoremediation?

Phyto: to bring forth using plants
Remediation: to correct a problem

Put together, the words describe an emerging technology using green plants to clean up contaminated environmental media. As phytoremediation has been increasingly recognized, the technology has been applied both *in situ* (right where the contamination has taken place) or *ex situ* (by excavating contaminated soil, sediment, sludge, groundwater, surface water, wastewater and then remedying it).

Although it is now increasingly being applied for environmental mediation, phytoremediation is not a new technology. Roman civilization reportedly used eucalyptus trees to de-water saturated soils more than two thousand years ago. The excess water use by some plants has long been recognized as a nuisance in the agricultural industry, particularly in more arid regions. Water levels next to cottonwood and willow trees in the southwestern United States are known to drop several feet during growing seasons as these trees take up from several gallons to several thousands of gallons per day.

Principles of phytoremediation for environmental cleanup began in the late 1970s or early '80s. Application of this technology increased dramatically in the late 1980s and early '90s because it is low cost and versatile, and in some cases has better public support as a method to clean up contaminated media. Phytoremediation was first implemented and reported as an environmental cleanup technology for agricultural contaminants such as pesticides and excess plant nutrients—nitrate, ammonia and phosphate (Briggs, Bromilow and Bromilow, 1982)—although the principles of phytoremediation have been applied in the wastewater industry for many years. This remedial technology has been used in hundreds of cases worldwide.

The US Environmental Protection Agency has identified six broad applications of phytoremediation. Some of these include translocating the contamination to the roots, trunk or limbs to be more easily dealt with. Other methods bring the media to those same areas to be degraded by the plant, while other applications contain the media within the immediate groundwater instead of letting it flow off site. Another use is as a self-containing vegetation cap over a landfill.

Types of Vegetation Currently Used in Phytoremediation

As the technology expands, the types of plants identified for phytoremediation applications for both

continued on page 5

Debut: The Insider, a New Communication Tool!
See page 12.

Help! Our Mailing List Needs Repair

Somehow the mailing list for this newsletter was corrupted. Some first names were randomly shifted up or down so they no longer coincide with the right last name. As far as we know the last names are still with the right address, so we hope you are getting this.

We need your help to fix the list. If your name or address is incorrect, please send us your correct information either to DNR Urban Forestry Newsletter List, PO Box 7921, Madison WI 53707 or Katherine.Esposito@dnr.state.wi.us. Please include the identification number at the top of the label. If you are receiving multiple copies or you no longer wish to receive this newsletter, please send us your name and the label ID number that you wish to *delete*.

Thanks very much for your help!

WISCONSIN DEPT. OF NATURAL RESOURCES

Volume 12 Number 3 Fall 2004

Inside this issue:

Community Profile:

Village of Fort McCoy

No Wasteland Here: Fort McCoy Teems with Wildlife

by Jim Kerkman CF
Forester, Fort McCoy

U.S. Army photo by Fort McCoy Public Affairs

Fort McCoy is a US Army installation located in Monroe County between the cities of Tomah and Sparta. The installation is named for Robert Bruce McCoy, the son of a Civil War captain. McCoy was a prominent local resident who, throughout his lifetime, served as a lawyer, district attorney, county judge and mayor of Sparta. He reached the rank of major general during his 31 years of distinguished military service, which included service in the Spanish–American War, the police action in Mexico and World War I.

By 1905, McCoy had acquired 4000 acres of land in the Sparta area and offered the land for a training test by the army in that year. In 1909, the army was impressed enough to buy 14,200 acres—including McCoy's 4000 acres—for an artillery camp. In 1926, the training area was officially designated Camp McCoy in honor of Maj. Gen. Robert B. McCoy, who died that same year. The name was changed to Fort McCoy in 1974. Between 1938 and 1942, an additional 47,000 acres were acquired by a directive from the secretary of war, bringing the total area to approximately 60,000 acres, its present size. During this time, a large, triangular-shaped cantonment area was constructed. This serves as the administrative center and functions as a small city.

During World War II, Camp McCoy was used as a training facility for many army units, including the 2nd Infantry Division, the 76th Infantry Division and the 100th Infantry Battalion, which was comprised of Hawaii National Guardsmen of Japanese ancestry. The post also served as a prisoner-of-war and enemy–alien prison camp during this time. Aside from temporary lulls, the installation has been in almost constant use since its founding and has provided artillery and maneuver training opportunities for hundreds of thousands of military personnel from all services.

Today, Fort McCoy's primary mission is providing for the training and ensuring the readiness of America's reserve and active-component armed forces. It also serves as a Power Projection Platform by processing and preparing soldiers for duty in the Global War on Terrorism.

With all this military activity you would expect Fort McCoy to look like a barren wasteland, but that is hardly the case. There are three state-recognized natural areas at Fort McCoy, two pristine stream headwaters and a high-quality oak barrens remnant. It also contains one of the largest remaining populations of the federally endangered Karner blue butterfly, two active bald eagle nests, a pack of grey wolves, a large deer herd, and a host of state threatened and endangered species that thrive in savanna/barrens habitats. The DNR has listed Fort McCoy as one of the top 10

continued on page 4

2

Community Profile:
Tree City USA: Since 1989
Growth Awards: 1993 & 1994
Population: 3283 employees (1657 civilian, 1002 military, 624 contractual); 130,950 military service personnel trained in 2003
Property acreage: 60,000 total; 3000 mowed/managed acres
Buildings: 1161, including barracks, administrative, dining & maintenance facilities
Primary industry: military training and support

Program Profile:
Staff: 1 full-time forester; 1 full-time technician; 10 FT and 8 PT grounds maintenance personnel
Advisory Body: Roads & Grounds Dept.
Equipment: brush chipper, stump grinder, tree spade, hydroseeder (for watering), hand tools; access to loaders & dump trucks

2003 Program Statistics:
Planted: 8 trees, 60 shrubs
Pruned: 3910 trees & shrubs
Removed: 695 trees; 283 stumps
Watering: 180 hours
Contract Costs: ~$49,000

Wisconsin Urban & Community Forests
A Quarterly Newsletter of the Wisconsin Department of Natural Resources, Forestry Division

Published quarterly by the Wisconsin Department of Natural Resources, Forestry Division.

Address inquiries to Dick Rideout, Wisconsin Department of Natural Resources, PO Box 7921, Madison, WI 53707

Editor: Dick Rideout
Contributors: Cindy Casey, Don Kissinger, Tracy Salisbury, Kim Sebastian, Jessica Schmidt, Kristina Skowronski

PRINTED ON RECYCLED PAPER

Articles, news items, photos and ideas are welcome.

This newsletter is made possible in part by a grant from the United States Department of Agriculture Forest Service. The USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. To file a complaint call (202) 720-5964.

Project Profile:

Mequon Nature Preserve – Restoring the Past

3

by Kristina Skowronski
DNR Southeast Region

In a time when development pressures are great, the city of Mequon has taken a large step to preserve and restore their land for the future—a goal that will take over 150 years to complete. The Mequon Nature Preserve is 356 acres of land that the city purchased over the past two years with the help of the Ozaukee Washington Land Trust. OWLT handled all of the real estate transactions. This year, OWLT received a DNR Stewardship Grant to purchase an additional 52-acre tract of land that will bring the preserve area to over 400 acres. This additional land joins three woodlots and enables Mequon to restore a larger area to the historic beech-maple forest of the past. With the exception of the three woodlots, the land is primarily agricultural and has been farmed for many years.

Photo by WDNR

Natural pond area forming after over five miles of drain tile was removed by the Wisconsin Waterfowl Association.

A Plan is Created

In 2003, the City of Mequon received a grant through the Wisconsin DNR's Urban Forestry Program to create a restoration plan for the preserve. An ecological restoration planning team was established that pooled the knowledge of many biologists, ecologists and foresters. Their goal was to evaluate and guide the long-term ecological recovery of the site. This plan was successfully completed and adopted in February of 2004. The plan includes multiple components, such as forest and wetland restoration, wildlife restoration, a public access plan, invasive species control and a variety of educational opportunities.

Phase One Begins

With so much to do, where do they start? Currently, Mequon is partnering with the Greater Milwaukee Foundation and the Ozaukee Washington Land Trust to fund a nature preserve manager who is overseeing the plan's implementation. Also, two students were hired over the summer to remove buckthorn and other invasive species.

Wisconsin Waterfowl Association funded and managed the removal of over five miles of drain tile that was present on 50 acres of the preserve property. Since their removal, areas have begun to flood again, forming natural pond areas. In those areas, native wetland plants such as cattail, rushes, willow herbs and water plantain now grow.

This fall, direct seeding of a section of previously agricultural land is beginning. Mequon is actively searching for volunteers to collect tree seed or landowners that have native species on their property and are willing to let volunteers on their land to collect seed.

The preserve has a lot of other opportunities to offer to community members as well as visitors. Through research and restoration activities the city hopes to involve students and volunteers in a wide variety of educational opportunities. The city is also seeking funding to install hiking and biking trails to allow for complete public access.

continued on page 10

Photo by WDNR

Secretary Scott Hassett visited the Mequon Nature Preserve in May. From L to R: Dan Kaemmerer, Gloria McCutcheon, Frank Trcka, Tom Blotz, Secretary Hassett, Mayor Nuernberg, Chip Krohn, Kim Sebastian, and John Hammen.

Village of Fort McCoy

continued from page 2

priority grassland management areas for the state. The natural resources staff work with the military training officers to ensure that training activities are conducted in the most environmentally friendly manner possible.

The urban area of Fort McCoy, called the cantonment, was designed in a triad layout in 1941. This design allows up to 35,000 troops to live and train together without being crowded by other units, yet close enough to operate efficiently under one headquarters. Actual construction began in February 1942, and was completed in August 1942. The quick construction and triad design left many "wild" areas among the buildings, giving Fort McCoy a heavily wooded look. The official design of Fort McCoy includes two trees within the triad, symbolizing the prominent trees and Fort McCoy's commitment to the environment.

Native trees retained during the cantonment construction became the first landscaping on Fort McCoy. Tree planting started during the 1940s when prisoners of war planted seedlings in scattered areas around the camp. In the late 1940s, several hundred spruce trees were purchased and planted throughout the cantonment area. Up until the 1970s, landscape plantings were done intermittently, based on availability of funds. In the late 1960s, the land management plan specified activities for tree and shrub maintenance and protection, and included a section on instructions for landscape plantings.

In 1989, Julian Hutchinson, the chief of natural resources, held an Arbor Day planting ceremony to get started on the Tree City USA Award requirements. That year, Fort McCoy earned its first Tree City USA Award and has earned one each consecutive year. The years 1993 and 1994 brought Fort McCoy Tree City USA Growth Award for management planning, continuing education for its tree workers and updating an urban tree inventory. The first inventory was done in 1990, with updates in 1993 and 1999.

In the past few years, the grounds crew—whose tasks include urban tree care—has gone through two major changes. In 1998, the natural resources staff, including the forester, were separated from the grounds department and moved into the Directorate of Training, Mobilization and Security, while grounds stayed under the Directorate of Engineering. In January 2003, most of the engineering functions were contracted out to VT Griffin Services, Inc., including grounds maintenance. Although there is not a direct link between the forester and the grounds department, there is still plenty of interaction. Forestry assists with insect and disease identification, species/site selection, organizing Arbor Day ceremonies, and completing the Tree City USA application.

The 1999 urban tree inventory tallied 9422 trees and shrubs. Trees native to the area—jack pine, black oak, red pine and white pine—make up 44 percent of the total. These trees are mostly left over from the cantonment construction in the 1940s. The 1993 inventory listed these trees as 76 percent of the total, showing that the older trees are rapidly declining. This decline is well illustrated by jack pine, a relatively short-lived tree, going from 36 percent to 18 percent of the inventory in six years. Recent tree plantings have focused on more species diversity, showcasing newly constructed buildings and highlighting important road intersections. Trees tolerating sandy soil, such as hackberry, red oak, river birch and honeylocust, will improve diversity and replace what is lost.

The grounds crew foreman, Moe Kremmer, was part of the grounds crew before contracting. He brings continuity to the program and has kept the accomplishments on pace with previous years. The tree care duties of the grounds crew include planting and transplanting, pruning, dead and dying tree removal, stump grinding, watering and tree protection. The cantonment area has a large deer population, and each fall many small trees and shrubs are caged to prevent browse and scraping damage. Moe started protecting newly planted trees from mower and weed-trimmer damage by placing rubber tree guards around their base.

Arbor Day plantings have been done continually since 1989, when the Fort McCoy commander planted a white pine outside the headquarters building. Each year there is a new opportunity to raise awareness of how important trees are to the Fort McCoy community. Some of the most enjoyable plantings have involved the Child Development Center—Fort McCoy's daycare. The children really enjoy planting and watering pine seedlings. The 2004 Arbor Day ceremony involved planting a green ash in the Fort McCoy Commemorative Area to highlight the start of a major planting plan for the area. The commemorative area is a cluster of restored WWII buildings furnished with WWII artifacts, the Fort McCoy Historical Center and vehicle displays. A group of large white pines had to be removed from the area because of drought damage and the danger of dying trees in a park-like setting. The planting plan will occur in stages so it will be complete in 2009, the 100th anniversary of Fort McCoy's founding. The commemorative area is the site of the Fort McCoy Open House, held each year on Armed Forces Day. In 2005, the open house is May 21. More information about Fort McCoy can be found at www.mccoy.army.mil.

Phytoremediation: Green Creating Clean

continued from page 1

organic and inorganic compounds have expanded. Early efforts were focused on utilization of hybrid poplar—fast-growing, phreatophytic (water loving) trees which have well-documented physiologic and genetic characteristics from their use in the pulp and paper industry and from biomass fuel research. Many more types of vegetation—grasses as well as trees—are now being applied in phytoremediation. Well over 400 different plants are known to have the ability to remove harmful media from affected areas.

Benefits and Limitations to Phytoremediation

Phytoremediation is becoming recognized as a cost-effective remedial method to address contaminated sites and landfills. Advantages to phytoremediation include its low capital cost, which is generally about one-third to one-fifth that of more conventional technologies. In addition, this technology tends to have low costs for ongoing operation and maintenance, although it should *not* be construed as maintenance free. The combination of effectiveness, low cost, and low operation and maintenance costs makes phytoremediation attractive for non-point source contamination, such as nitrates and pesticides in agricultural settings and parking lot runoff in urban areas. Some plant species can also reduce the net infiltration of surface water, which minimizes the potential for leaching of contaminants into groundwater.

Phytoremediation has been accepted by the public, since it is environmentally compatible and can improve the long-term aesthetics of a site. Phytoremediation can be used as a single-treatment technology, or it can be coupled with more aggressive conventional technologies. For example, contaminated soils from a site can be excavated and treated in engineered phytoremediation treatment units, rather than thermally treated or taken off site and disposed of in a landfill. Contaminated groundwater can also be pumped from a site using conventional methods and used as irrigation for trees or grasses to capture the contaminants.

Despite the benefits of phytoremediation, there are disadvantages to the technology that make it unsuitable or undesirable for some applications. Phytoremediation is a long-term remedial technology at most sites, with treatment times on the order of several years. In addition, the technology can be directly implemented only where the contaminants are present at depths within about 20 feet of the land surface. If vegetation is used for the purpose of extracting groundwater, the contaminants must be located within a few feet of the water table surface. Plants have adapted to grow in some of the most inhospitable conditions known to exist. However, phytoremediation will not be successful if soil conditions or contaminant characteristics/concentration prove to be phytotoxic. Phytoremediation of metals poses special considerations that can make its use impracticable at this time. For example, the consequences of transferring contamination from soil or groundwater into plants that can enter the food chain must be considered, particularly for heavy metals such as lead and cadmium which have detrimental effects on human health.

Phytoremediation Engineering Considerations

Phytoremediation is an active approach to site cleanup. Although it is an approach that utilizes natural processes, a successful phytoremediation system must be similar in certain ways to conventional methods. Designers must:

- fully understand the geology of the site and contaminants within the area
- clearly define remedial objectives — Are they *quantitative*, to reduce to a specific level of contamination such as can be defined by parts per million? Or are they more *qualitative*, such as establishing a vegetative cover to reduce windblown dust?
- establish a time frame for remediation — Since the technology is new, specific cleanup time frames have not been fully established, thus flexibility must be built in to the system.
- know the fate of contaminants within the plant system — A well-designed laboratory potting study or greenhouse experiment with soil from the site is needed to document this.
- know species of vegetation and planting techniques — Appropriate choices will largely define whether a phytoremediation project is a success or failure. Site constraints often result in selection of sub-optimal species.
- expect operation and maintenance — A common pitfall is the misconception that phytoremediation is maintenance free. This is not true, and has lead to the failure of numerous projects. O & M requirements include watering, insecticide applications and dealing with natural predation by wildlife.

The Future of Phytoremediation

Because of the trend toward more passive remedial technologies and the recognition of the importance of

continued on page 11

Community Tree Profile:

6

Miyabe Maple (Acer miyabei)

by Laura G. Jull
Dept. of Horticulture
University of Wisconsin–Madison

Native To: Northern Japan

Mature Height: 30–40’ or more

Spread: 30–40’

Form: Upright-oval to rounded form; branches low to the ground; short trunk

Growth Rate: Slow to moderate

Foliage: Opposite, simple leaves, palmately lobed; lobes are pointed but have rounded to wavy margins, 4–6” across; dark green and pubescent on the undersides of the leaves; petioles contain milky sap

Photo by Laura Jull

Miyabe Maple (Acer miyabei)

Limitations: Hard to find in nurseries. Turfgrass does not grow well in dense shade underneath Miyabe maple.

Comments: Miyabe maple is an underused, urban tolerant, medium-sized tree suitable for urban and residential environments. Its soil and pH adaptability make this tree suitable for planting in Wisconsin. Excellent, alternative tree species to use over hedge maple (*Acer campestre*) as Miyabe maple is more cold hardy. Miyabe maple is not invasive based on years of observation at the Morton Arboretum.

Photo by Laura Jull

Miyabe maple leaves.

Buds and Stems: Stems are brown; buds are smooth, imbricate with each bud scale having tiny hairs at the tips along the margins

Fall Color: Showy, yellow, in late fall

Flowers: Not showy, insignificant, pyramidal, yellowish-green corymbs in mid-spring

Fruit: Double samara (schizocarp), green turning brown, late summer to fall; seeds on top of samaras are slightly pubescent and silky; samara wings spread straight across and are fringed along the bottom, often uneven in size

Bark: Grayish, scaly, somewhat corky looking

Site Requirements: Adaptable to a wide range of soils and pH; prefers full sun and moist, well-drained soil, though is moderately drought and salt tolerant, urban tolerant, easy to transplant

Hardiness Zone: 4a to 6b

Insect & Disease Problems: None serious, but can get Verticillium wilt as it is a maple; can leaf scorch in severe droughts

Suggested Applications: Miyabe maple is an excellent, medium-sized tree with a number of landscape uses. It requires less space than larger shade trees, is urban tolerant, suitable to commercial and residential landscapes and makes a nice street tree if limbed up for clearance. Dense branches close to the ground can provide screening of unsightly views. Miyabe maple also can function as a specimen plant in a landscape.

Common Cultivars or Selections:

‘Morton’: State Street® Miyabe maple, 40’ tall by 30’ wide; upright, oval to broad-pyramidal form with ascending branches, good branch structure, faster grower than straight species, often grafted higher up trunk to allow for vehicular and pedestrian clearance; drought, heat, and urban tolerant. State Street® was released in 2001 as part of the Chicagoland Grows program. It is available from large nurseries across the US.

References:

Landscape Plants for Eastern North America, 2nd ed., 1997, by H. L. Flint, John Wiley and Sons, Inc., New York.

Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses, 5th ed., 1998, by M. A. Dirr, Stipes Publishing, Champaign, IL.

Maples of the World, 1994, by D. M. van Gelderen, P. C. de Jong, and H. J. Oterdoom, Timber Press, Portland, OR.

North American Landscape Trees, 1996, by A. L. Jacobson, Ten Speed Press, Berkeley, CA.

Plants that Merit Attention: Vol. 1 Trees, 1984, The Garden Club of America, Janet Meakin Poor (ed.), Timber Press, Portland, OR.

Trees for Urban and Suburban Landscapes, 1997, by E. F. Gilman, Delmar Publishers, Albany, NY.

Urban Tree Health Matters:

No Skeletons Allowed: Remove Summer's Wilted Elms and Oaks before Spring

by Glen R. Stanosz, Ph.D
Departments of Plant Pathology and
Forest Ecology and Management
University of Wisconsin–Madison

Destruction of elms and oaks by wilt diseases leaves landscapes scarred with their bare skeletons. The cost of removal seems an insult added to the injury caused by the loss of their beauty and value. But the pathogenic fungi that cause Dutch elm disease and oak wilt survive over the winter in recently killed trees. And in spring, spores of these fungi are disseminated from these newly dead trees to infect and kill others. Therefore, urban tree disease management requires the timely elimination of summer's wilted elms and oaks.

Dutch elm disease is caused by two closely related fungi, *Ophiostoma ulmi* and *Ophiostoma novo-ulmi*. Although these fungi can move short distances from tree to tree through interconnected or "grafted" elm roots, they are carried longer distances by insect vectors. Both the native American elm bark beetle and the exotic European elm bark beetle carry spores of these fungi on their bodies. As these beetles feed on elm twigs and branches, the fungus spores are deposited in the feeding wounds. The fungi grow quickly, spreading in twigs, branches, the trunks and roots of elms, causing plugging and malfunction of the water conducting tissues to result in foliage wilt and tree death. Large numbers of adult beetles may be attracted to the dying elms. They burrow into branches and trunks, mate and deposit eggs in "galleries" tunneled between the bark and wood. The two Dutch elm disease pathogens also colonize these galleries, producing their own reproductive structures and spores borne in sticky masses. Contact between the fungi and the next generation of beetles is inevitable. When these beetles emerge the following spring (i.e., the first spring after tree death), they carry the fungal spores as they fly off to feed in—and thereby inoculate—other elms.

Oak wilt is caused by the fungus *Ceratocystis fagacearum*. This fungus also can move short distances from tree to tree through grafted oak roots, and is carried longer distances by insect vectors. A variety of beetles, many in the family Nitidulidae (which includes the familiar "picnic beetles" or sap-feeding beetles), carry spores of this fungus on their bodies. However, the manner of acquisition of pathogen spores by oak wilt vectors is very different from the way Dutch elm disease pathogen spores are picked up by elm bark beetles. Nitidulid beetles do not breed in dying oaks. But during the spring after an oak is killed by *C. fagacearum*, this fungus produces its reproductive structures on mats under oak bark. The sweet and fruity odor of these mats attracts beetles that enter through bark cracks and feed on the fungus. Spores stick to the beetle bodies, and when these beetles also fly to fresh oak wounds to feed on sap, trees are inoculated with the pathogen.

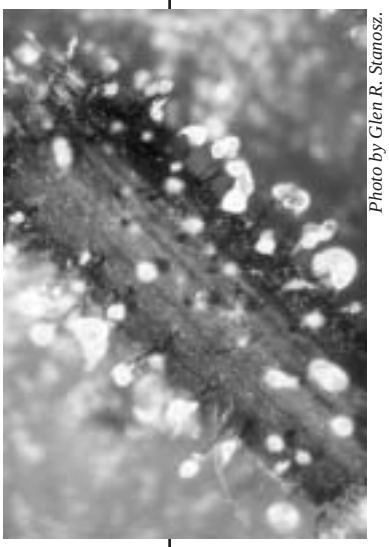


Photo by Glen R. Stanosz.

Spores of the Dutch elm disease pathogens are produced in sticky masses on black stalks in galleries of elm bark beetles. Beetles acquire these spores by bumping into these sticky masses.

Prompt removal of elms killed by Dutch elm disease and oaks killed by oak wilt will contribute to management of these diseases by reducing long-distance spread of their respective pathogens. Trees should be cut in the late summer, fall or winter after death…spring is too late! In addition to cutting down these corpses, they should be burned or buried, or finely chipped and properly composted to destroy vectors and pathogens. Any portions of these dead trees retained for firewood should be thoroughly debarked. Debarking will create conditions that kill the developing elm bark beetles as well as death of Dutch elm disease and oak wilt pathogens.

What Damaged This Tree?

Photo by Jeff Hagfors, Wächtel Tree Science & Service, Inc.

Turn to page 15 to find out...

The Community Toolbox: Time-Buster Tips

8

compiled by Kim Sebastian
DNR Southeast Region

From "Best of Nonprofit Nuts & Bolts" in the Free Articles section of Nuts & Bolts Publishing Inc.'s Web site, www.nutsbolts.com.

For meetings, include time limits on the agenda, indicating the amount of time available to discuss each agenda item. Bring a timer to meetings to help keep discussions on schedule.

When someone arrives late for a meeting, don't waste others' time by rehashing what's already been covered in his or her absence.

Use a "tickler" file to keep track of items that need action or follow-up. Choose a brightly colored file (perhaps red or yellow), keep it in a visible, easily accessible place and use it daily. This reduces the chance of important tasks falling through the cracks.

When someone asks if you have a minute to talk, and you really don't, say so. Be polite in your response and respectful of the person's needs by scheduling a time to talk later. Then, at that time, give the person your full attention.

To keep meetings productive, only invite those who are necessary to accomplish the intended results of the meeting. Inviting unneeded people only bogs down meeting productivity.

Update all your mailing lists annually. This saves mailing preparation time by eliminating duplicates, purging outdated addresses, etc. Bonus: it saves money and increases efficiency by improving the delivery of your mail.

When preparing reports and other written communications, keep them thorough, but brief. This saves you the time of preparing an unnecessarily long document. Plus, it saves the recipient time because he or she doesn't have to read superfluous information to get to the vital facts.

Give important contacts a key word to use in e-mail subject headers. This enables you to sort important e-mail quickly.

Create standard formats for documents such as meeting minutes, committee reports and agendas. This will save time for both those who prepare the documents and those who read them.

Take time off, whether it's a one-week vacation or several long weekends over the course of the year. If you don't, you'll not only burn out, but you'll burn out those around you as well. If it helps, think of a vacation as your personal renewal time.

Always carry with you some type of work that you can do in unexpected down time. Some ideas: reading material; cassette recorder for dictating memos or recording ideas; questionnaires and surveys to complete.

Interruptions eat up your time at the office every day. If possible, set up a home office and telecommute a few hours a week.

Coming Events

January 19-21, 2005 – ***Mid-Am Horticultural Trade Show***, Lakeside Center at McCormick Place, Chicago, IL. Contact the Mid-Am at 847-526-2010, mail@midam.org or www.midam.org.

January 27, 2005 – ***Green Industry Workshop,*** Rotary Gardens, Janesville, WI. Contact www.uwex.edu/ces/cty/rock/hort/2005CommercialEducationPrograms.html.

January 30-February 1, 2005 – ***DNR Annual Urban Forestry Conference/ Wisconsin Arborist Association Annual Conference and Trade Show***, Regency Suites Hotel and KI Conference Center, Green Bay, WI. Contact Dave Graham, 608-756-5561 or dwgco@ticon.net.

February 28-March 1, 2005 – ***Municipal Engineering Fundamentals for Non-Engineers***, Concourse Hotel, Madison, WI. Contact http://epdweb.engr.wisc.edu/emaG423 or call 1-800-462-0876 and request brochure #G423.

Urban Forest Insect Pests:

Lumps, Bumps and Fuzzy Things: Galls on Oak Tree Leaves

9

by Linda Williams, Forest Health Specialist
DNR Northeast Region

Those strange lumps, bumps and fuzzy things on leaves are called galls. Galls are abnormal growths that are caused by the feeding of mites or insects. The saliva of the insect causes the plant to create the gall, which then offers the insect a sheltered area where it can feed. Many tree species get galls on their leaves but this article will focus on the galls found on oak leaves.

Oak apple galls are the large, golfball-sized galls that form on a petiole or leaf midrib. These galls will turn a light tan color in the fall and will be very light-weight. If you cut one open when the gall is still green, you will find a single gall-wasp larva inside. If a gall has a small hole in it, the little adult wasp has already emerged.

Oak apple gall

Round, "spiky" galls on either the top or bottom of the leaf are hedgehog galls. These galls appear fuzzy with soft reddish spikes. If you have grape-sized round galls on your tree in places where there should be leaves you probably have roly-poly galls. Or, if you have small, flat, saucer-like galls that seem to congregate on the underside of your oak leaves then you have jumping oak gall. All are caused by different species of gall wasps.

Photos by WDNR

Hedgehog galls

Another insect that causes galls on oak leaves is the midge, which is in the fly family. Midges cause warty-looking galls found on the underside of the leaf along the main veins. Once a gall has appeared on the leaf there is little that can be done. If you find the gall offensive you can prune that leaf off the tree, but the majority of leaf galls are of little consequence to the health of your tree so you can leave the galls alone and enjoy the variety that you find on your leaves.

Jumping galls

April 18-20, 2005 – *Trees & Utilities National Conference*, Embassy Suites Downtown, Omaha, NE. Contact the National Arbor Day Foundation at 402-474-5655, www.arborday.org/programs/Conferences.html or conferences@arborday.org.

May 23-25, 2005 – *Urban Wildlife Management National Conference*, Lied Lodge & Conference Center, Nebraska City, NE. Contact the National Arbor Day Foundation at 402-474-5655, www.arborday.org/programs/Conferences.html or conferences@arborday.org.

August 6-10, 2005 – *International Society of Arboriculture Annual Conference*, Gaylord Opryland Hotel, Nashville, TN. Contact Jessica Marx, 888-472-8733 or jmarx@isa-arbor.com.

November 17-18, 2005 – *National Urban Forest Conference,* The Westin-Charlotte, Charlotte, NC. Contact www.americanforests.org/conference/.

If there is a meeting, conference, workshop or other event you would like listed here, please contact Dick Rideout at 608-267-0843 with the information.

Award-Winning DNR Brochures Available to Help Manage Wildlife

by Ricky Lien, Urban Wildlife Specialist
Bureau of Wildlife Management

Survey after survey supports the general statement that people enjoy seeing wildlife. And that statement holds true even in urban communities. While wild animals in the wrong place (a deer in the mall parking lot) or in excessive numbers (three hundred geese at your city park) can cause problems, most people enjoy the opportunity to see animals in their community. And for wildlife populations to thrive, healthy habitats are a must. Many property owners, large and small, public and private, would be glad to improve the habitat available on their land if they only knew how.

Mary Kay Salwey, the education specialist for the DNR Bureau of Wildlife Management, has worked with a number of wildlife and education specialists to produce a series of brochures on managing land for wildlife. The *Wildlife and Your Land* series won the 1997 Conservation Education Award in the Articles/ Series category from the Wildlife Society. The titles of the available articles give a taste of what can be done, from the simple to the highly involved, to attract and promote wildlife:

- Calling All Wildlife – Wildlife Management Basics
- Putting Pen to Paper – Developing Your Wildlife Management Plan
- Getting the Help You Need – People and Dollars for Wildlife
- How to Inventory and Monitor Wildlife on Your Land
- Wisconsin Wildlife Primer – Wildlife Habits and Habitat
- So, What Should I Plant? – Trees, Shrubs and Vines with Wildlife Values
- To Cut or Not to Cut? – Managing Your Woodland for Wildlife
- Critter Condo – Managing Dead Wood for Wildlife
- Rabbitat – Brushpiles for Wildlife
- On Edge – Managing Edge for Wildlife
- Gimme Shelter – Shelterbelts and Food Plots for Wildlife
- Home on the Range – Restoring and Maintaining Grasslands for Wildlife
- Just Add Water! – Restoring Shallow Wetlands for Wildlife
- The Wealth of Waterways – Managing Stream Corridors for Wildlife

The entire series may be viewed on-line at www.dnr.state.wi.us/org/land/wildlife/publ/wildland.htm or copies may be obtained by contacting your local DNR office.

And while I'm promoting the use of the above series as a means to benefit wildlife, secondary benefits can also be found by implementing the various land management practices that are described. For example, if you take a large mowed area and turn it into a native grassland, not only have you given grassland birds some new habitat, you've also eliminated or cut back on the work needed to mow, the expense and toxicity problems of weed control chemicals, storm runoff to waterways and a potential goose problem because geese like mowed areas, not tall grass. Restoring shallow wetlands has benefits as well. Not only is great waterfowl habitat provided, benefiting many other aquatic species, but the wetland also filters pollution from runoff water, acts as a sponge to reduce flooding problems and helps restore water to underground aquifers.

In addition to various publications on beneficial land management, the DNR's Bureau of Wildlife Management has Private Lands Wildlife Biologists who are anxious to help you figure out what is possible to do to benefit wildlife—and get all the other advantages—on your property. Contact your local DNR service center to get in touch with one of these folks.

Mequon Nature Preserve

continued from page 3

The Future is Bright

Mequon Nature Preserve is steadily moving forward with the help of many successful partnerships and dedicated volunteers. According to Mayor Christine Nuernberg, "The Mequon Nature Preserve will serve future generations because of the great partnerships. Without the assistance and commitment of the Greater Milwaukee Foundation, the Ozaukee Washington Land Trust, the Department of Natural Resources and others, the preserve would be only a dream." If you'd like more information about the project and how you can contribute, please visit the city of Mequon's Web site at www.ci.mequon.wi.us.

Organization Profile:

Center for Urban Initiatives and Research

11

by Kristina Skowronski
DNR South Central Region

For over 25 years, the University of Wisconsin–Milwaukee Center for Urban Initiatives and Research has been providing research services and technical assistance to public and nonprofit organizations to help them make informed policy choices.

CUIR promotes strategic partnerships across disciplines and sectors, integrating a dynamic network of expertise to address urban issues. Some of the projects created through CUIR partnerships include EPIC (Empowering People for Informed Choices), which provides information on K–12 schools in Milwaukee; ENTECH (Empowering Nonprofits in Technology), which disseminates research and information to support the technological capacity of nonprofit organizations; and Compass Guide, which is designed to increase access to secondary education, particularly to low-income and minority youth. For access and further information on these programs, log on to their Web site listed below.

CUIR also offers a variety of services to strengthen communities, including:

- survey research
- program planning and evaluation
- strategic planning and strategic visioning
- focus group research
- data management and data analysis
- community assessments
- geographic mapping

On their Web site, CUIR lists ongoing and completed projects for the above categories. There you will find examples of the extent of their work. CUIR has conducted a large number of surveys on such topics as parks and recreation, needs assessments, future development/planning, youth issues and land use. Communities that have participated in these surveys include Germantown, West Bend, Brookfield, Slinger and Brown Deer. Cedarburg, Glendale and Mequon have also worked with CUIR on strategic planning projects.

Another way CUIR connects with their audience is through newsletters and published information. CUIR publishes a periodic newsletter, *Research and Opinion*, designed to communicate information on urban issues through research articles and opinion pieces. Subscription to the newsletter is free. Examples of topics in back issues include intergovernmental cooperation, park public policy, and parks and recreation in Milwaukee County. The Web site also maintains a list of other reports that may be beneficial to community managers, such as public policy and recreation.

For more information on the University of Wisconsin–Milwaukee Center for Urban Initiatives and Research, please visit their Web site at www.uwm.edu/Dept/CUIR/, or contact Stephen Percy, Director, at 414-229-5916.

Phytoremediation: Green Creating Clean

continued from page 5

natural processes, this process holds promise in the overall remediation marketplace. There will be growth in three areas: 1) the types of vegetation used for phytoremediation, 2) expanded applications of phytoremediation and integration of phytoremediation with natural processes, and 3) engineered systems, architectural design and site planning.

Based on its aesthetic appeal and overall low cost, phytoremediation will increasingly be used as an alternative to brownfields redevelopment. However, it is critical that the technology be applied appropriately, using sound engineering principles and properly trained personnel. Please consider adding this mechanism to your community's toolbox of options when dealing with contaminated sites.

References

Briggs, G.G., Bromilow, R.H. and Bromilow, A.A. 1982. *Relationships between Lipophilicity and Root Uptake and Translocation of Non-ionized Chemicals by Barley*. Pesticide Science (13):495–503.

Research Notes:

The Relationship Between Urban Leaf Area and Household Energy Usage in Terre Haute, Indiana, US

by Ryan R. Jensen, James R. Boulton and Bruce T. Harper
Departments of Geography, Geology, and Anthropology
Indiana State University
Terre Haute, Indiana

Putting a dollar amount on urban forestry benefits is an essential step in garnering support for preserving and expanding the urban forest resource. The purpose of this study is to demonstrate that decreased household cooling costs can be effectively estimated using an approach that combines remote sensing technologies with standard statistical analysis. This study tests the relationship between urban forest leaf area index (LAI) and household energy usage. Results indicate that as LAI increases, energy usage decreases. Studies like this could serve to promote the direct economic benefits associated with urban forestry programs. Urban planners and others could use this study to promote urban forests and justify urban forestry programs.

Reference: *Journal of Arboriculture*, Vol.29, No.4. July, 2003.

Debut: The Insider, a New Communication Tool!

In September, DNR Urban Forestry premiered the "Wisconsin Urban Forestry Insider," an electronic newsletter of breaking news and valuable information for the urban forest community in Wisconsin and beyond.

Our goal was to create a communication vehicle that could be more timely than the one you are now reading. It consists of an e-mail and a link to the Insider Web page, and is sent to two groups of people: those who subscribe and those on certain DNR address lists.

There are many advantages to a Web-based newsletter. Being able to link to other documents and Web sites is one of them. Second, the Web is a two-way street. Your contributions are welcome in any form: mere ideas, full stories, announcements, digital photographs, links. Third, it allows for quick networking when important issues arise.

We publish the Insider every two weeks, so if you forget to send something for one issue, there's another just down the pike.

Visit the Insider at: http://dnr.wi.gov/org/land/forestry/UF/resources/InsiderArchive.html

To subscribe, click the "to subscribe" button that you see after opening the Web site.

The Idea Exchange...

compiled by Jessica Schmidt
DNR Northeast Region

Weird Trees of Indiana Contest

As part of this year's Arbor Day celebrations, the Jackson County (Indiana) Soil and Water Conservation Department cooperated with their Department of Natural Resources, Division of Forestry to search for Indiana's weirdest trees. What is a "weird tree," you wonder? Well, maybe the tree has almost completely swallowed a sign or other object, or maybe it has the most misshapen trunk ever seen. But for whatever reason, these trees stand out as different. To enter, one must take two color photographs of the tree that capture its unique qualities and send them to the Indiana Division of Forestry. District foresters will select the weirdest tree from each county, and these will be included in "Invasion of the Weird Trees" on the division's Web site. *Info: www.in.gov/dnr/forestry/pdfs/invasion2002.pdf.*

Green Roofs and Brownfields Remediation in Chicago

Mayor Richard Daley has built the first municipal rooftop garden on city hall and opened one of only five LEED (Leadership in Energy and Environmental Design) platinum-certified buildings in the country. A dozen more city buildings are expected to be LEED certified, including three libraries, several fire stations, a police station and a refueling station for the city's newly purchased fleet of natural-gas vehicles. The Department of Environment, established under Daley in 1992, has overseen the remediation of 1,000 acres of brownfield sites. Chicago has lured green technology businesses, such as solar-panel manufacturers, by using the city's purchasing power. An entire sustainable landscaping industry has sprung up around the city's beautification initiatives. Daley has even hired a cadre of ambitious young assistants who answer directly to him on everything from improving wastewater management to overhauling the city's recycling program to restoring one of the largest wetland areas in North America, on the southeast side of Chicago. *Info: Contact Suzanne Malec, smalec@cityofchicago.org.*

Seattle Partners Seek $50 Million to Save Urban Forest

Seattle Mayor Greg Nickels announced a plan to raise up to $50 million over the next 20 years from public and private sources to save the city's urban forests. The city owns about 3,700 acres of forest, about 60 to 70 percent of which is infested with various invasive species. Nickels's goal through the Green Seattle Partnership is to restore the 2,500 acres most at risk, with a deadline of 2024. However, as restoring an infested forest is expensive—costing $20,000 per acre—the city has formed a partnership with the Cascade Land Conservancy. Through the Green Seattle Partnership, the land conservancy and the city will seek funding from foundations, corporations and other donors. The city will split with the land conservancy the $100,000 of first-year startup costs to get the partnership—including the fund-raising campaign—started. The city's $50,000 share will come out of Nickels's existing budget.

Partnership Maps Wildland–Urban Interface

The wildland–urban interface, where houses meet or intermingle with wildland vegetation, is not only a high-value environment for users, but also a focal area for human–environment conflicts, such as wildland fires, habitat fragmentation, invasive species and biodiversity decline. The USDA Forest Service and the University of Wisconsin–Madison have released new scientific maps depicting the communities and lands within the WUI across the lower 48 states. This is the first consistent nationwide representation of the WUI as defined in the *Federal Register* and makes possible mapping and analysis at national, state and local levels. In all, 42 million homes or 37 percent of the nation's total are in the WUI. These lands comprise 273,000 square miles or nine percent of the 48 states. The maps are available at http://silvis.forest.wisc.edu/Library/WUILibrary.asp. Additional background information is available at http://silvis.forest.wisc.edu/projects/WUI_Main.asp.

Does your community or organization have an idea, project or information that may be beneficial to others? Please let your regional urban forestry coordinator know. We will print as many of these as we can. If you see ideas you like here, give the contact person a call. They may be able to help you in your urban forestry efforts.

Council News:

by Dave Liska
Council Chair

Hello! Since assuming the chairmanship of the Urban Forestry Council in July, this is my initial foray into conveying council activities, issues, and concerns. Please keep in mind that council activities are driven by the expressed needs and concerns of all those who participate in the many and varied facets of urban forestry and arboriculture.

Three interesting developments have occurred recently that have or will directly impact the way urban forests are perceived.

The fall of 2004 is turning out to be quite exciting, hectic, and intriguing with regard to urban forestry. During August, the Wisconsin Green Industry Economic Survey was released. The survey indicated that Wisconsin's Green Industry had a stunning economic impact of 2.7 billion dollars annually! Definitely an indication that Wisconsin residents place a high value on things "green." Also this summer, the Wisconsin Center for Environmental Education at the University of Wisconsin-Stevens Point, through the LEAF program (Learning, Experiences, and Activities in Forestry), solicited numerous individuals for their insights related to urban forestry. Their intent is to provide an urban forestry component as part of their K-12 Forestry Education Program and Curriculum. What better way to create an awareness for the importance and value of our urban forests than to present it in the classroom as part of the educational process. We will wait with a great deal of anticipation for the product that is the result of this survey. The DNR is providing funding to accelerate this process.

Finally, the Governor's Conference on Forestry hosted by the Wisconsin Council on Forestry was held on November 9th and 10th in Madison. The intent of this conference was to develop an action plan that will enable stakeholders to come together on important forestry issues to sustain and enhance Wisconsin's forests. Seven themes were identified for the Wisconsin Statewide Forest Plan. URBAN FORESTRY is one of these themes. The Urban Forestry Council formed an eight-member "theme team" to present a picture of urban forestry and its most important priorities.

This opportunity will allow urban forestry to create linkages and partnerships with traditional forestry venues with shared issues and areas of concern. The potential for urban forestry to become more understood, recognized, and respected is tremendous.

We will continue to apprise you of developments within these critical areas as they occur.

Urban Forestry Council Member Receives Local Award

Wisconsin Urban Forestry Council member Joan Stevens was recently named Volunteer of the Year by the Greenfield Chamber of Commerce. In presenting the award, the chamber highlighted her accomplishments. They include: founding the Greenfield Beautification Committee; presenting annual awards to well-landscaped homes and businesses; helping to enact Greenfield's tree ordinance; coordinating over 1,500 volunteers annually for Keep Greater Milwaukee Beautiful Green Up/Clean Up Day; guiding the Greenfield Tree Commission as it planted 4,000 street trees; and directing 13 Arbor Day celebrations that resulted in the planting of more than 700 trees and shrubs in Greenfield. Joan is well deserving of this honor. Congratulations!

Photo by Bill Stevens

Wisconsin Urban Forestry Council member Joan Stevens

Urban Forestry Resources:

Storm Response

compiled by Cindy Casey
DNR West Central Region

Tree managers can find a variety of printed and electronic resources to help prepare for and respond to storm emergencies in the urban forest. Here are some to try:

When a Storm Strikes. Tree City USA Bulletin No. 2. Available in hard copy to Tree City USA Award recipients or by joining Friends of Tree City USA ($10 membership). Contact The National Arbor Day Foundation, 100 Arbor Ave., Nebraska City, NE 68410.

Trees and Ice Storms: The Development of Ice Storm-Resistant Urban Tree Populations. This 1994 USDA Forest Service publication can be downloaded from the University of Illinois, Cooperative Extension Service Web site, www.ag.uiuc.edu/~vista/abstracts/aicestorm.html.

Storms Over the Urban Forest: Planning, Responding, and Regreening—A Community Guide to Natural Disaster Relief. Another 1994 USDA Forest Service publication, this one is available in on-line format, at www.na.fs.fed.us/spfo/urbanforestry/ucf.htm. Click on "Publications and Information," then scroll down the alphabetized list to the publication title.

National Arbor Day Foundation – www.arborday.org. This Web site has a series of ready-made, electronic press releases intended for quick dissemination beginning immediately after a major storm event. Click on the "Media" tab, then scroll down to "Storm Recovery Information."

International Society of Arboriculture – www.treesaregood.com/pressrelease/press.asp. Over two dozen tree-related press releases can be downloaded from this site, including three on the subject of emergency planning and response.

Northeast Center for Urban and Community Forestry – www.umass.edu/urbantree/forest.shtml. Two items of particular interest are available on this Web site, both listed under "Other Tools." Click on "Storm Damage Assessment for Urban Areas" for a storm damage assessment protocol—a standard method for estimating hazard mitigation and cleanup costs for purposes of disaster aid assistance. The *Tree Emergency Manual for Public Officials* is a downloadable, step-by-step guide that walks the user safely through the storm response process. Hot links to FEMA forms and other resources are included.

TreeLink – www.treelink.org/. Click on "Management," then go either to "Disaster Management" or "FEMA" for useful bibliographies of disaster resources, such as the American Red Cross Web site, Disaster Education Network, FEMA directory, etc.

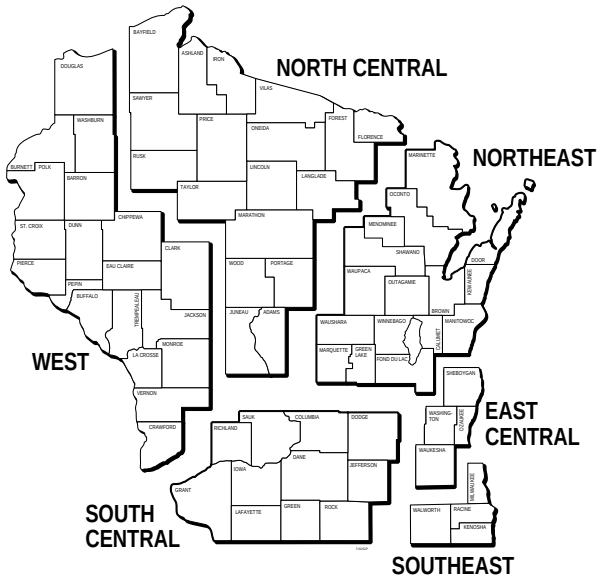
What Damaged This Tree?

Photo by Jeff Hagfors, Wachtel Tree Science & Service, Inc.

Answer: A new exotic insect called the disk-footed, yellow-capped *Geometer gigantreum* subsp. *plastreum*.

Do you have pictures of tree damage others ought to know about? Send them to Kim Sebastian (address on page 16) and we'll print them here!

Wisconsin DNR Urban and Community Forestry Contacts



World Wide Web Site: www.dnr.state.wi.us/org/land/forestry/uf/

West

Cindy Casey
Regional Urban Forestry Coord.
1300 West Clairmont Ave.
Box 4001
Eau Claire, WI 54702
Phone: (715) 839-1606
Fax: (715) 839-6076
e-mail:Cynthia.Casey-Widstrand@dnr.state.wi.us

North Central

Don Kissinger
Regional Urban Forestry Coord.
5301 Rib Mountain Drive
Wausau, WI 54401
Phone: (715) 359-5793
Fax: (715) 355-5253
e-mail: Don.Kissinger@dnr.state.wi.us

South Central

Jeff Roe
Regional Urban Forestry Coord.
3911 Fish Hatchery Road
Fitchburg, WI 53711
Phone: (608) 275-3256
Fax: (608) 275-3236
e-mail: Jeffrey.Roe@dnr.state.wi.us

State Coordinator

Dick Rideout
State Urban Forestry Coord.
101 S Webster St
PO Box 7921
Madison WI 53707
Phone: (608) 267-0843
Fax: (608) 266-8576
e-mail: Richard.Rideout@dnr.state.wi.us

Northeast

Tracy Salisbury
Regional Urban Forestry Coord.
1125 N. Military Ave.
P.O. Box 10448
Green Bay, WI 54307
Phone: (920) 492-5950
Fax: (920) 492-5913
e-mail: Tracy.Salisbury@dnr.state.wi.us

Southeast and East Central

Kim Sebastian
Regional Urban Forestry Coord.
2300 N. Martin Luther King Jr. Dr.
Milwaukee, WI 53212
Phone: (414) 263-8602
Fax: (414) 263-8661
e-mail: Kim.Sebastian@dnr.state.wi.us

SERVICE TO PEOPLE AND THEIR RESOURCE
DIVISION OF FORESTRY
SINCE 1904

Wisconsin Urban & Community Forests
A Quarterly Newsletter of the Wisconsin Department of Natural Resources, Forestry Division

P.O. Box 7921, Madison WI 53707

Address Service requested

Presorted Standard
U.S. Postage
Paid
Madison, WI
Permit 906